UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

DATE: JUN 17 2002

SUBJECT: The Nature and Extent of Lead in Soils and Groundwater and the Finding & Recommendations Regarding a Conceptual Strategy for the Dayco/LE Carpenter Site, Wharton Borough, NJ

FROM: Adolph Everett, Chief
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TO: Kim O'Connell, Chief
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The Freshwater Protection Section (FPS) is concurrently reviewing the above documents and is providing the following comments

General Overview:

There is insufficient soil and groundwater characterization data to justify the conclusions on the extent and fate of the free product and lead contamination. A better delineation of the groundwater elevations and flow patterns is needed between the site and the river. An additional geological cross section may better illustrate the site's stratifigraphy and extent of the contaminated soils impacting the groundwater. More data on the solid phase and groundwater redox parameters are needed within the contaminated soil and underlying groundwater. A 100 and 500 year flood plain assessment must be done to rule out any possiblity of river water inundating the remediation sites. An adequate post remediation monitoring plan should be included to assure the reliability of the remediation strategies. An investigation of the potential groundwater discharge zones should be considered if LNAPLs or lead contamination is found to be migrating toward the river.

Specific Comments

1. Elevated river levels may potentially impact parts of the site. The flooding of the site may increase the mobilization of contaminants in the sediments and soils and contribute to the migration of lead and LNAPLS into the groundwater and surface water. Sections of the project area may fall within the 100-year and 500-year flood plain as determined by the Federal Emergency Management Agency. These is no reference to a delineation of the 100-year and 500-year flood plains in the previous RI. The unpredicted migration of lead via surface runoff and inundation due to flooding episodes should be considered in any proposed remedial action.

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2. More information is needed on the groundwater elevations within the entire contaminated area and extending to the river. Watertable maps and a detailed horizontal, and vertical groundwater flow analysis of the upper impacted aquifer should be provided especially between the excavation areas and the river. It's unclear how much deeper the lead contamination which extends down to 10 feet in depth, is present within the groundwater or surface aquifer (Nature and Extent of Lead in Soils and Groundwater, figure 2). The seasonally high watertable is relatively close to the ground surface and varies between 5 and 15 feet in depth across the site. A sporadic mounding of the groundwater, which occurs during seasonally high watertable levels, was detected east of building 14 near an area of deep lead contaminated soils (Free Product Remediation strategy, section 3.5). This mounding was speculated to be induced by finer grained soils but is now currently absent because of this year's drought suppressed groundwater levels.

3. The geological cross section A-A' (Free Product Remediation strategy figures 4 and 5) incompletely intersects the site and poorly illustrates the extent of the strata and the shallow aquifer under the site. The hydrogeologic profile fails to clearly show how far the fill and debris layers, which contain the free product and lead contaminated soils, extend below the maximum Piezometric level or the seasonally high water table. Some of deepest hot spots of lead contaminated soils are located off the A-A' axis of the geological cross section (Nature and Extent of Lead in Soils and Groundwater, figure 2). Besides the surface soil test pit SS-16 several other soil borings including GPC-15A, GPB-2,GPB-10, and GPC-15-15, had lead concentrations (from a depth of 6 to 9 feet) which were many times above the soil screening criteria of 600 ppm. These borings were not illustrated on the geological cross section A-A' (figure 3. Nature and Extent of Lead in Soils and Groundwater). No detailed groundwater levels presented or discussed at many specific boring locations. To intersect more of the soil borings across the site, another cross section is needed to extending from somewhere north of point A to a location south of point A'.

4. It's unclear if an adequate aqueous and solid phase geochemistry characterization was conducted at the site. The groundwater sampling program did include standard pH and Eh measurements but such measurements are often not sufficient and need to be interpreted within the context of additional geochemical and biochemical data. Numerous aqueous and solid state redox measurement parameters must be known to assure that the lead contamination is non-mobile and poses no risk to groundwater and surface water. This data is needed to confirm if the negative synthetic precipitation leaching procedure(SPLP) test results and the detection of limited groundwater contamination are sufficient evidence of no significant leaching from the lead contaminated soils (Nature and Extent of Lead in Soils and Groundwater, Executive Summary). Any change in the following redox parameters in the soils and aquifer, such as dissolved oxygen, total dissolved carbon, speciation of iron sulfur or nitrogen, etc., could influence the potential concentrations and the migration of lead and LNAPLs into and within the groundwater.

5. The remediation strategies have to implement a post remediation monitoring plan to insure that there is no future contamination of the groundwater and potentially the Rockaway River. The post remediation monitoring should provide the following:

* Detect changes in the geochemical or hydrologic environment that could affect remedy effectiveness such as pH, hydraulic gradients, oxygen levels and, organic carbon

* Determine if the plume is expanding both horizontally or vertically

* Insure that contaminant impacts will not reach downgradient receptors

* Detect any new releases of contaminants that could impact the effectiveness of the selected remedy

* Identify possible toxic transformation products such as organic lead complexes

An unanticipated reduction in the ambient pH to near 5.0 either in the soils or groundwater could mobilize any existing lead compounds and shifts in the redox potential could induce the formation of soluble lead transformation byproducts. Tetra methyl lead may form as a result of biological alkylation of organic and inorganic lead compounds by anaerobic microorganisms in the soils and groundwater. Tetra ethyl and tetraethyl lead could subsequently be metabolized into trialkyl lead oxides which are highly water soluble and subject to leaching. The concurrent excavation of free product and lead contaminated soils could affect the percolation of surface water and the mesoscale groundwater flow patterns near the river.

The performance monitoring should continue for a specified period, generally 2 years, after cleanup levels have been achieved and the groundwater monitoring conducted in at least two groundwater wells between the excavation sites and the Rockaway River. The monitoring must be long enough to assure that no re-contamination is occurring in the groundwater and that there is no subsequent discharge of lead or LNAPLs into the river.

6. There should be some kind of contingency plan in case the selected remedies fail to perform as anticipated. If lead or LNAPLs are detected in the groundwater, especially near the river, there may be a need to locate any areas of possible groundwater discharge into the river. Seepage meters or buried passive bag sampling could provide extensive data on the pore water characteristics along the river bottom. If compared to the groundwater characteristics, this data may reveal the volume and distribution of the groundwater discharges. Several transects or

grids of seepage meters could be placed along the river suspected to be impacted by the groundwater intercepting the site. The location of and orientation of these transects should be first based on a comprehensive analysis of the vertical and horizontal groundwater flow patterns and an initial temperature profile (infra-red or conductivity) screening of the surface water in the planned sampling areas. Seepage meter sampling has proven effective in the identification of distinct groundwater discharge areas into a surface water body reveal the subsequent groundwater flow paths intercepting a lake, river or stream bottom.

If you have any questions regarding the above comments please contact Frank Scotto at Ext. 7-3849.

cc: Stephan Cipot, RRD/NJRB